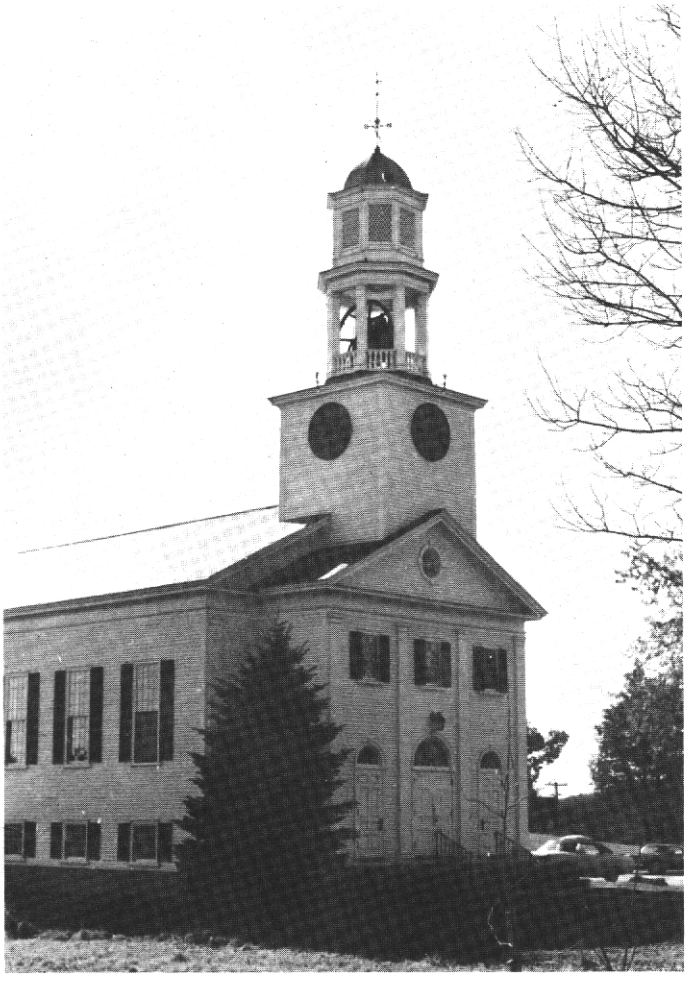
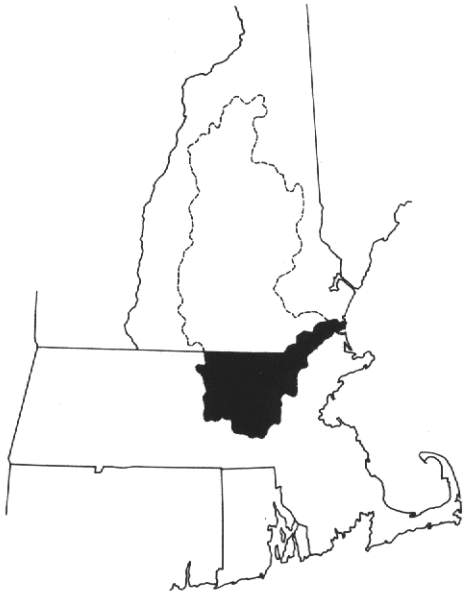
MERRIMACK WASTEWATER MANAGEMENT

key to a clean river



APPENDIX IV-C

AESTHETIC IMPACTS



NORTHEASTERN UNITED STATES WATER SUPPLY STUDY NOVEMBER 1974

MERRIMACK WASTEWATER MANAGEMENT
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MERRIMACK WASTEWATER MANAGEMENT

(KEY TO A CLEAN RIVER)

APPENDIX IV-C

RECREATIONAL, AESTHETIC, AND CULTURAL IMPACT ANALYSIS

of Alternative Wastewater Management Systems
in the Massachusetts Merrimack River Basin

November 1974

CONTENTS

I. INTRODUCTION

This study is aimed at assessing the effects of six alternative wastewater management systems in the Merrimack River Basin of Massachusetts on the recreational, aesthetic, and cultural values of the environment. The assessment is limited to analyzing what detrimental or beneficial changes are likely to occur, to what extent the existing environment would be changed, and for what general period of time the change will endure. Omitted from the study is an evaluation of the impacts the environmental changes would have on the concerns of the interest groups. Also, the study is a concentration on existing conditions of the environment and does not include consideration of projected conditions in 1990 and 2020.

The data defining the proposed alternative systems was supplied by the Corps of Engineers, and the data for the environmental conditions was obtained from U.S. Geological Survey maps generally dated 1966, and interviews with representatives of the regional planning agencies in the study area.

The scope of concern for the kinds of effects the proposed systems would have on the environment were determined by the format established in the Handbook for Assessing the Social and Economic Impacts of Water Quality Management Plans prepared for the Federal Environmental Protection Agency by Abt Associates, Inc., in July, 1973. This format establishes a broad-based monitoring of the proposed alternatives by including the effects of Water Quality, Water Supply, Collection System, Treatment Products, Construction, Land Modification, and Operations. The effects of Capital Cost Funding and Private Abatement Actions which were a part of the format are omitted since they are considered irrelevant to the concerns in this section of the study.

The effects are considered differently depending on whether the issues of study are given specific geographic consideration or not. Land Modification effects alone are considered geographically, and consequently this effect on the recreational, aesthetic and cultural values is organized under each proposed alternative by numbered geographic zones that have been identified on the Location Map attached to this section of the report. The remaining effects on the environment are considered generically and presented in brief text form.

II. SUMMARY AND CONCLUSIONS

Among the three categories of environmental values studied in this section of the report, their significance in relation to the degree of environmental change is in the descending order of aesthetic, recreational, and cultural. Almost all changes identified are detrimental to one degree or another. Land Modification is singly the most influential effect studied. Some changes caused by Land Modification are considered POTENTIALLY beneficial to recreation values if additional expenditures are made.

Aesthetic

Aesthetic changes are dominantly visual in nature and are primarily caused by the effects of Land Modifications. The construction of the rapid infiltration systems have the most dramatic change by causing degradation of 100 to 200 acres of land per disposal parcel. While the resultant appearance of these areas is preserved open space, the character which is created is strongly manmade in nature. The treatment plants have the next most visually noticeable changes because of the height of building structures and several acres of developed area. Pipelines create the third most visually noticeable changes with the linear corridors which would be cleared during construction. Almost all of these changes are long-term, detrimental effects which have a potential to be partially retrieved through restoration efforts. Others of these changes have either a permanent loss of visually aesthetic quality, a disruption of resources that are regenerable through natural, ecological processes or, as in a few select cases, have a potentially beneficial effect if the water outfalls are constructed as an artistically sculptured element.

Another area of aesthetic change is caused by the Construction effects of the wastewater system. Views and general visual character will be temporarily disrupted by the construction activity and the traffic congestion it generates and more extensively degraded by the clearing of vegetation that will require time to grow back. Noise and odors are minor peripheral changes that will occur during construction.

To a relatively small extent, the Water Supply effects are beneficial. A few opportunities exist to have dramatic water sculpture effects at outfalls in order to create a focus and add visual quality to an area. In a few select locations of certain proposals, the waters of the Concord River are augmented to improve the conditions of odor, turbidity, and shallow water.

Recreation

Although recreation changes are almost exclusively beneficial in nature, they are almost all only potential opportunities contingent upon additional funding. The beneficial changes gained without significant additional costs are paths located over pipelines which generally range in length from 1 to 3 miles.

The potential recreational opportunities are made by adding land to treatment plant and land application facilities and providing recreational facilities to create multi-use development. Recreational provisions may include a conservation park, field sports area, and/or architectural facilities. Some of the identified opportunities serve only local areas while others serve more regional areas.

Cultural

The extent of cultural changes caused to the environment is marginal at most. A half dozen conflicts have been identified with historic settings, educational institutions, seminaries, and cemeteries. Most cases involve the degradation of views from these points or of adjacent settings. A few instances have pipelines located on or near the property.

Conclusions

1. Land Modification and Construction are only two effects that cause significant, long-term changes to the recreation, aesthetic, and cultural values of the environment.

2. The Land Modification effects on Aesthetic values will generally be the most noticeable changes by the alternatives; in particular, the land application alternatives will cause the most detrimental changes.

3. The Land Modification effects on Recreational values are significant and beneficial only if additional funds are allotted for land acquisition, site design, and site development. This is particularly true since the locations of transmission lines may be supportive of regional open space and recreation plans.

4. Construction effects on Aesthetic values will be detrimental to a moderately significant degree for a short-term duration.

III. RECOMMENDATIONS FOR FURTHER STUDY

To confirm the conclusions of this section of the report, a subsequent phase of study will be necessary. The finally selected alternative will need detailed layout studies in order to formulate a final, recommended site-development plan. An investigation is needed to determine various ways detrimental effects can be minimized and beneficial effects maximized. Outlined below are the major stages of study that will be needed.

1. Detailed Site Selection: Strategic determination of location, size, and shape of land parcels and rights-of-way.

2. Site Analysis: On-site reconnaissance to identify problems and opportunities of each site and its surroundings under present and future conditions.

3. Site and Facility Design: Alternative illustrative layouts for the buildings and grounds to demonstrate the various potential effects that are possible.

4. Cost Estimate: Preliminary indication of design, construction, and maintenance costs implied with each design.

5. Community Values Survey: Investigation of interest group reactions to the design studies and costs and determine their priorities of concern.

6. Impact Evaluation: Judge the degree of detrimental and beneficial effects of the proposed design solutions on the concerns of the interest groups.

IV. RECREATIONAL VALUES

The study of recreational values in the environment is a consideration of the change the alternative sewerage systems may cause to the existing recreation resources and facilities and to potential opportunities for development. Described below and listed by the various possible effects of the systems are the changes that are likely to occur in the recreational environment.

A. Water Quality/Recreation Changes

(Socio-Economic Report - Annex A)

B. Water Supply/Recreation Changes

Generally all the occurrences of proposed water augmentation do not provide significant increases to water flow in the rivers with the one exception of the Concord River. Alternative Nos. 1 and 3 may add flows to the point of increasing boating activity along that section of the river (3± miles).

C. Collection System/Recreation Changes

The major change which could be created by the whole system as an entity is the land use changes generated by the availability of sewerage service. Because the basis upon which the sewerage service areas were defined was exclusively to serve the future plans of the communities, no detrimental changes to the recreational uses should occur.

D. Treatment Products/Recreation Changes

As proposed, the disposal of water, sludge and smoke has neither detrimental nor beneficial changes to existing or potential recreation values.

E. Construction/Recreation Changes

No significant changes are caused by the effects of construction on the recreational environment.

F. Land Modification/Recreation Changes

Analysis Technique

The analysis of changes to recreational values involved determining the types of conflicts or support that may occur with each alternative.

This was done by cross-comparing the proposed elements of the sewerage systems with the environmental elements of recreation value and determining the detrimental and beneficial interactions that are likely to occur.

The most significant recreational changes are related to one or more of the following environmental elements:

1. Path System.
2. Passive Park and Wildlife Area.
3. Water Access (visual).
4. Boat Landing.
5. Recreation Facility.

The proposed systems are composed of the major elements that are discussed below and are the prominent Land Modifications which cause the environmental changes. Each is described for its inherent or potential attributes that may create a recreational change:

1. Pipelines: Paths over cleared areas; possible creation of physical and visual access to water.

2. Treatment Plants: Only potential opportunities that are contingent upon additional land acquisition; include field sports, developed facilities and waterfront access.

3. Outfalls and Flow Augmentation: Only flow augmentation offers recreation possibilities. Increased flow can increase boating, fishing and visual enjoyment of the water.

4. Spray Irrigation Facilities: These areas of approximately 100 to 200 acres in size may be appropriate for recreational areas such as wildlife conservation.

5. Rapid Infiltration Facility: These areas of approximately 100 to 200 acres in size are usually divided into 25-acre sand-filtration beds. The small portion of land, perhaps 10% of the total area, lies between these beds and offers the possibility of providing a small path system and a passive/wildlife park facility. Additional land acquisition could allow for the development of recreation facilities.

Pumping stations and incineration facilities of the systems have no significant recreation potential associated with them.

All the potentially beneficial Land Modification effects on the recreational environment are summarized on the matrix below.

BENEFICIAL RECREATION OPPORTUNITIES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines	X		X	X	
2. Treatment Plants			X	X	X
3. Outfalls & Flow Augmentation				X	
4. Spray Irrigation Facilities	X	X	X	X	X
5. Rapid Infiltration Facilities	X	X			X

Analysis Criteria

Changes to the recreation values in the environment are described by the extent and duration of the change. The various measures of these dimensions are listed on the axes of the matrices shown below. A generalized, standard rating scheme has been established among the interrelationships of these dimensions by estimating the large, moderate, and small degrees of environmental change that would occur in the environment. These criteria, as shown on the matrices below, were applied to each of the significant changes geographically identified in the study area. An environmental change may be an effect upon a natural resource, an ambient quality or character, a land use activity, or a physical facility.

DEGREES OF DETRIMENTAL CHANGE

EXTENT \ DURATION OF CHANGE	Long Term	Short Term
1. Permanent destruction (a)	L	L
2. Retrievable degradation (b)	L	M
3. Regenerable disruption (c)	M	S
4. Interfering Interruption (d)	M	S

LEGEND

L = Large
M = Moderate
S = Small

(a) Destruction may be partially alleviated through manmade efforts.
(b) Degradation may be partially retrievable through manmade efforts.
(c) Disruption may be entirely or partially regenerable through natural ecological processes.
(d) Interruptions cease when interferences are terminated.

DEGREES OF BENEFICIAL CHANGE

DURATION OF EFFORT / EXTENT	Upon Completion of Construction	Contingent upon Additional Development
L. Unique Opportunity	L	M
2. Major Benefit	L	M
3. Minor Benefit	M	S

LEGEND

L = Large
M = Moderate
S = Small

Outlined below are types of recommendations and related cost factors involved to decrease detrimental changes or to create POTENTIAL beneficial changes. The methods comprise the basis of the recommendation made for each of the changes identified in the analysis data presented in the following section. Each change, therefore, can be quantified by reading the conditions specified in the recommendations and applying an appropriate cost factor from the range of costs.

Types of Recommendations	Descriptive Range of Effort	Quantified Range of Cost
Land Acquisition	Minor-Moderate-Extensive	5% to 50% of originally planned acreage
Site Improvement	Minor-Moderate-Extensive	$1,000 to $20,000 per acre
Site Planning and Design	Standard Schedule of Consulting Fees	4% to 15% of construction cost
Land Restoration and Management	Careful-Rigorous	$1,000 to $10,000 per acre

Analysis Data

Utilizing the analysis matrix and criteria described above, each environmental change that was geographically located has been analyzed and described on the data sheets which follow. They are organized firstly by Alternatives 1 through 6 and secondly by numerical order of the geographic areas identified on the Location Map.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : ONE
General Location : Beaver Brook and Double Brook
(4) Dracut, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines	M		M		
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity with Pipe Lines (1.5+miles appropor-tionately) if provided, strategic location and sensitive site and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : ONE
General Location : Concord River
(7) Billerica, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants			S	M	M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity if provided minor to moderate acquisition, and moderate site improvements.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : ONE
General Location : Duck Island, Merrimack River
(8) Lowell, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants				M	M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity if provided with minor acquisition and moderate site improvements.

Type of Environmental Change: LAND MODIFICATION / RECREATION

Alternative Number : ONE

General Location : Meadow River and Millvale Reservoir

(13) Haverhill, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines	M				
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: Opportunity to create a path system to increase exposure to water for over approximately 3 miles, connections to Northern Essex Community College, Millvale Reservoir, Merrimack River, and (with Alternatives nos. 5 and 6 only) potential park at rapid infiltration area.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : ONE
General Location : Merrimack River
(16) Newburyport, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants		M	L	M	L
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Potential opportunity along riverfront if provided moderate land acquisition, moderate to extensive site improvements, and sensitive site, grading, and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : ONE
General Location : Brown Point
(17) Salisbury, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Potential opportunity if provided moderate land acquisition, moderate to extensive site improvements, and sensitive site, grading, and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : ONE
General Location : East Boxford Village
(29) Boxford, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity if provided with minor to moderate acquisition and moderate to extensive improvements.

Type of Environmental Change: LAND MODIFICATION / RECREATION

Alternative Number : THREE

General Location : Beaver Brook and Double Brook

(4) Dracut, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines	M		M		
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: POTENTIAL opportunity with Pipe Lines (1.5+miles appropor-tionately) if provided, strategic location and sensitive site and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : THREE
General Location : Duck Island, Merrimack River
(8) Lowell, MA

DETRIMENTAL CHANGES

ENVIRONMENTAL ELEMENT / PROPOSED ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

ENVIRONMENTAL ELEMENT / PROPOSED ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants				M	M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity if provided with minor acquisition and moderate site improvements.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : THREE
General Location : Meadow River and Millvale Reservoir
(13) Haverhill, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines	M				
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Opportunity to create a path system to increase exposure to water for over approximately 3 miles, connections to Northern Essex Community College, Millvale Reservoir, Merrimack River, and (with Alternatives nos. 5 and 6 only) potential park at rapid infiltration area.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : THREE
General Location : Brown Point
(17) Salisbury, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Potential opportunity if provided moderate land acquisition, moderate to extensive site improvements, and sensitive site, grading, and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : THREE
General Location : Penn Brook
(22) Georgetown, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines	S				
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Opportunity to implement over 1.0 miles of path along Penn Brook if provided strategic location and sensitive site and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION

Alternative Number : FOUR

General Location : Beaver Brook and Double Brook

(4) Dracut, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines	M		M		
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: POTENTIAL opportunity with Pipe Lines (1.5+miles appraportionately) if provided, strategic location and sensitive site and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FOUR
General Location : Duck Island, Merrimack River
(8) Lowell, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants				M	M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity if provided with minor acquisition and moderate site improvements.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FOUR
General Location : Meadow River and Millvale Reservoir
(13) Haverhill, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines	M				
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Opportunity to create a path system to increase exposure to water for over approximately 3 miles, connections to Northern Essex Community College, Millvale Reservoir, Merrimack River, and (with Alternatives nos.5 and 6 only) potential park at rapid infiltration area.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FOUR
General Location : Penn Brook
(22) Georgetown, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines	S				
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Opportunity to implement over 1.0 miles of path along Penn Brook if provided strategic location and sensitive site and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FOUR
General Location : South Banks, Merrimack River
(?4) Andover, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines	L		L		L
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Transmission line construction would disrupt approximately 3 miles of presently held conservation land.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FIVE
General Location : Nashua River
(2) Lancaster and Shirley, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines	L		L		
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Unique opportunity to create a permanent path system providing a greatly needed visual exposure to the River, for over approximately 5 miles.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FIVE
General Location : Nashua River
(3) Pepperall, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines	M		M	M	
2. Treatment Plants			M	M	M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities		M			
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity under the following conditions: Pipe lines, approximately 1.5 miles,: if provided minor acquisition and site improvements, strategic location and sensitive site and planting design. Treatment Plant: if provided moderate acquisition (5 to 10 acres) and site improvements. Rapid Infiltration: if provided extensive acquisition (25% or 75 acres+), moderate site improvements, strategic, location and sensitive site, grading, and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FIVE
General Location : Beaver Brook and Double Brook
(4) Dracut, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines	M		M		
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity with Pipe Lines (1.5+miles appropor-tionately) if provided, strategic location and sensitive site and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION

Alternative Number : FIVE

General Location : Bear Hill, Rtes 495 and 225

(6) Westford, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: Degradation of scenic view from top of ski slope, retrievable by sensitive siting of facilities, architectural design and screening.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities		M			M
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: POTENTIAL opportunity under the following conditions: Treatment Plant: if provided with moderate land acquisition and site improvements. Spray Irrigation: if provided with moderate acquisition (10% or 77+-acres), moderate to extensive site improvements, and sensitive site, grading, and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FIVE
General Location : Duck Island, Merrimack River
(8) Lowell, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants				M	M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity if provided with minor acquisition and moderate site improvements.

Type of Environmental Change: LAND MODIFICATION / RECREATION

Alternative Number : FIVE

General Location : Hales Island, Merrimack River

(10) Haverhill, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					L
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities		M			S
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: Potential Opportunity under the following conditions: Rapid Infiltration Facilities (Alternative 5 and 6 only): if provided extensive acquisition (25% or 55+acres), moderate site improvements, strategic location, sensitive site, grading and planting design, and rigorous land restoration and management. Treatment Plant: if moderate to extensive acquisition and improvements provided with moderate acquisition and site improvements,

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FIVE
General Location : Littles Hill and Village of Marlboro
(11) Georgetown, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities		M			M
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity under the following conditions: Treatment Plant: if provided with moderate land acquisition and site improvements. Spray Irrigation: if provided with moderate acquisition (10% or 46+- acres), moderate to extensive improvements, and sensitive site, grading, and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FIVE
General Location : Hunsley Hills area
(12) Rowley, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities		M			M
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunities under the following conditions:
Treatment Plant - if provided with moderate land acquisition and site improvements.
Spray Irrigation - if provided with moderate acquisition (10% or 32+-acres), moderate to extensive site improvement, and sensitive site, grading, and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FIVE
General Location : Meadow River and Millvale Reservoir
(13) Haverhill, MA

DETRIMENTAL CHANGES

ENVIRONMENTAL ELEMENT / PROPOSED ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

ENVIRONMENTAL ELEMENT / PPOPOSED ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines	M				
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Opportunity to create a path system to increase exposure to water for over approximately 3 miles, connections to Northern Essex Community College, Millvale Reservoir, Merrimack River, and (with Alternatives nos. 5 and 6 only) potential park at rapid infiltration area.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FIVE
General Location : Docks Bridge, Merrimack River
(14) West Newbury, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity if provided with moderate land acquisition and site improvements.

Type of Environmental Change: LAND MODIFICATION / RECREATION

Alternative Number : FIVE

General Location : Indian River

(15) West Newbury, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities		M			M
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: POTENTIAL opportunity if provided with minor acquisition, (40'+-acres), moderate to extensive site improvements, and sensitive site, grading, and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FIVE
General Location : Merrimack River
(16) Newburyport, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants		M	L	M	L
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Potential opportunity along riverfront if provided moderate land acquisition, moderate to extensive site improvements, and sensitive site, grading, and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FIVE
General Location : Brown Point
(17) Salisbury, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Potential opportunity if provided moderate land acquisition, moderate to extensive site improvements, and sensitive site, grading, and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FIVE
General Location : Stoney Brook and Beaver Brook
(19) Westford, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines	L		M		
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Good opportunity to implement over 4 miles of path along brook if provided strategic location and sensitive site and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FIVE
General Location : Johnson Creek tributaries
(20) Groveland, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines	S				
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities	S	M			
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Pipe Lines - opportunity to implement 1.5 to 2.0 miles of path along streams if provided strategic location and sensitive site and planting design.
Rapid Infiltration - Potential opportunity if provided moderate acquisition (10% or 31+ acres), moderate site improvements, strategic layout, sensitive site, grading, and planting design, and rigorous land restoration and management.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FIVE
General Location : Davis Hill on the Concord River
(21) Concord, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities	S	M		S	
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Potential opportunity if provided moderate (10% or 14 acres) to Extensive (25% or 35 acres) land acquisition, moderate site improvements, strategic layout, sensitive site, grading and planting design, and rigorous land restoration and management.

Type of Environmental Change: LAND MODIFICATION / RECREATION

Alternative Number : FIVE

General Location : Sand Creek

(26) Rowley, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					S
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: POTENTIAL opportunity if provided with moderate land acquisition and site improvements.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FIVE
General Location : Fairhaven Hill, Sudbury River
(27) Concord, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities	S	M			
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity if provided with moderate (10% or ~~20+- acres)~~ to extensive (25% or 50+- acres) land acquisition, moderate site improvements, strategic layout, sensitive site, grading, and planting design, and rigorous land restoration and management.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FIVE
General Location : Stills Pond
(28) Boxford, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities	S	M			M
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity if provided with minor acquisition (5% or 45 +- acres , moderate to extensive site improvements, and sensitive site, grading, and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FIVE
General Location : East Boxford Village
(29) Boxford, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity if provided with minor to moderate acquisition and moderate to extensive improvements.

Type of Environmental Change: LAND MODIFICATION / RECREATION

Alternative Number : FIVE

General Location : Cobbler Brook and Neal Pond area

(30) Merrimack, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants		M			M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities		M			M
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: POTENTIAL opportunity under the following conditions: Treatment Plant - if provided with moderate land acquisition and moderate to extensive site improvements. Spray Irrigation - if provided with minor acquisition (5% or 15± acres), moderate to extensive site improvements, and sensitive site, grading, and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FIVE
General Location : Powwow River at Rte 495 and Lone Tree Hill
(31) Amesbury, MA

DETRIMENTAL CHANGES

ENVIRONMENTAL ELEMENT / PROPOSED ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

ENVIRONMENTAL ELEMENT / PPOPOSED ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants		M			M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities		M			
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity under the following conditions: Treatment Plant - if provided with moderate land acquisition and moderate site improvements. Rapid Infiltration - if provided with minor acquisition (5% or $5 \pm$ acres), moderate site improvements, and sensitive site, grading, and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FIVE
General Location : Elm Street
(32) Salisbury, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities		M			M
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity if provided w/ minor acquisition (5% or 6± acres), moderate site improvements, and sensitive site, grading, and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FIVE
General Location : Route 3 opposite Flint Pond
Tyngsborough, MA

(33)

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities		M			
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity if provided with minor acquisition (5% or 10± acres), moderate site improvements, and sensitive site, grading and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION

Alternative Number : FIVE

General Location : Haverhill - Riverside Airport area

(34) Haverhill, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities		M			
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: POTENTIAL opportunity if provided with minor acquisition (5% or $11^{\pm}$ acres), moderate site improvements, and sensitive site, grading, and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FIVE
General Location : Concord River
(7) Billerica, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants			S	M	M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity if provided minor to moderate acquisition, and moderate site improvements.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : SIX
General Location : Hales Island, Merrimack River
(10) Haverhill, MA

DETRIMENTAL CHANGES

ENVIRONMENTAL ELEMENT / PROPOSED ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

ENVIRONMENTAL ELEMENT / PROPOSED ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					L
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities		M			S
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Potential Opportunity under the following conditions: Rapid Infiltration Facilities (Alternative 5 and 6 only): if provided extensive acquisition (25% or 55+acres), moderate site improvements, strategic location, sensitive site, grading and planting design, and rigorous land restoration and management. Treatment Plant: if moderate to extensive acquisition and improvements provided with moderate acquisition and site improvements,

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : SIX
General Location : Littles Hill and Village of Marlboro
(11) Georgetown, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities		M			M
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity under the following conditions: Treatment Plant: if provided with moderate land acquisition and site improvements. Spray Irrigation: if provided with moderate acquisition (10% or 46+- acres), moderate to extensive improvements, and sensitive site, grading, and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : SIX
General Location : Hunsley Hills area
(12) Rowley, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities		M			M
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunities under the following conditions:
Treatment Plant - if provided with moderate land acquisition and site improvements.
Spray Irrigation - if provided with moderate acquisition (10% or 32+-acres), moderate to extensive site improvement, and sensitive site, grading, and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : SIX
General Location : Meadow River and Millvale Reservoir
(13) Haverhill, MA

DETRIMENTAL CHANGES

ENVIRONMENTAL ELEMENT / PROPOSED ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

ENVIRONMENTAL ELEMENT / PROPOSED ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines	M				
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Opportunity to create a path system to increase exposure to water for over approximately 3 miles, connections to Northern Essex Community College, Millvale Reservoir, Merrimack River, and (with Alternatives nos. 5 and 6 only) potential park at rapid infiltration area.

Type of Environmental Change: LAND MODIFICATION / RECREATION

Alternative Number : SIX

General Location : Indian River

(15) West Newbury, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities		M			M
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: POTENTIAL opportunity if provided with minor acquisition, (??+-acres), moderate to extensive site improvements, and sensitive site, grading, and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : SIX
General Location : Brown Point
(17) Salisbury, MA

DETRIMENTAL CHANGES

ENVIRONMENTAL ELEMENT / PROPOSED ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

ENVIRONMENTAL ELEMENT / PROPOSED ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Potential opportunity if provided moderate land acquisition, moderate to extensive site improvements, and sensitive site, grading, and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : SIX
General Location : Johnson Creek tributaries
(20) Groveland, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines	S				
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities	S	M			
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Pipe Lines - opportunity to implement 1.5 to 2.0 miles of path along streams if provided strategic location and sensitive site and planting design.
Rapid Infiltration - Potential opportunity if provided moderate acquisition (10% or 28±acres), moderate site improvements, strategic layout, sensitive site, grading, and planting design, and rigorous land restoration and management.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : SIX
General Location : Penn Brook
(22) Georgetown, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines	S				
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Opportunity to implement over 1.0 miles of path along Penn Brook if provided strategic location and sensitive site and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : SIX
General Location : Sand Creek
(26) Rowley, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					S
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity if provided with moderate land acquisition and site improvements.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : SIX
General Location : Stills Pond
(28) Boxford, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities	S	M			M
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity if provided with minor acquisition (5% or 16+- acres), moderate to extensive site improvements, and sensitive site, grading, and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION

Alternative Number : SIX

General Location : Powwow River at Rte 495 and Lone Tree Hill

(31) Amesbury, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants		M			M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities		M			
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: POTENTIAL opportunity under the following conditions: Treatment Plant - if provided with moderate land acquisition and moderate site improvements. Rapid Infiltration - if provided with minor acquisition (5% or 5 ± acres), moderate site improvements, and sensitive site, grading, and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION

Alternative Number : SIX

General Location : Elm Street

(32) Salisbury, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities		M			M
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: POTENTIAL opportunity if provided w/ minor acquisition (5% or 6± acres), moderate site improvements, and sensitive site, grading, and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : SIX
General Location : Haverhill - Riverside Airport area
(34) Haverhill, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities		M			
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity if provided with minor acquisition (5% or 11± acres), moderate site improvements, and sensitive site, grading, and planting design.

Interest Groups Affected

The various categories of interest groups are identified below and compared to the possible recreation opportunities. It is expected that all groups would have a general consensus on protecting the existing and implementing new opportunities for recreational resources and facilities. All six categories of interest groups, therefore, are anticipated to respond favorably to any inherent or potential recreation opportunities caused by the elements of the proposed sewerage systems.

POSSIBLE RECREATION OPPORTUNITIES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities	a. Unorganized Groups	b. Organized Groups	c. Local Government	d. Regional Government	e. State Government	f. Federal Government
1. Pipe Lines	X		X	X		X	X	X	X		X
2. Treatment Plants			X	X	X	X	X	X	X		
3. Outfalls & Flow Augmentation				X		X	X	X			
4. Spray Irrigation Facilities	X	X	X	X	X	X	X	X	X	X	X
5. Rapid Infiltration Facilities	X	X				X	X	X	X	X	X

G. Operations/Recreation

No operations of the proposed systems are expected to significantly affect recreation values either detrimentally or beneficially.

V. AESTHETIC VALUES

The study of aesthetic values in the environment is a consideration of the change the alternative sewerage systems may cause to the appealing visual resources and creation of noise and odor problems.

Described below and listed by the various possible effects of the systems are the environmental changes that are likely to occur in the aesthetic environment.

A. Water Quality/Aesthetic Changes

A general improvement to the water clarity and aroma would be noticeable in many instances. A higher standard of purity lessens the likelihood of algae, suspended solids, and coloration in the water. In locations where these characteristics are somewhat dramatic, a significant change will be noticeable.

Typical beneficial changes will be a transition to a more attractive water edge along rivers and streams, greater public attention to water bodies as amenities worthy of community pride, and a greater community desire to have visual and physical contact with the water.

B. Water Supply/Aesthetic Changes

A benefit of moderate importance is the possibility of a water display at the outfalls of treatment plants. A dramatic sculptural effect made from this unique water source could create a community focus on the water body in which it is displayed and instill a sense of awareness toward the process of water purification due to the constant reminder by the dynamic visual display.

A minor beneficial effect will be the increase of water supply to part of the Concord River (Alternative Nos. 1 and 3) and corresponding visual improvement to that section ($3\pm$ miles) of the river from the present low flow condition.

C. Collection System/Aesthetic Changes

The major change which could be created by the whole system as an entity is the land use changes generated by the availability of sewerage service. Because the basis on which the sewerage service areas were defined was exclusively to serve the future plans of the communities, no detrimental changes to the aesthetic character of the land should occur.

D. Treatment Products/Aesthetic Changes

As proposed, the disposal of water, sludge, and smoke has neither significant detrimental nor beneficial aesthetic effects.

E. Construction/Aesthetic Changes

There will be short-term disruption to views in which the proposed system elements are located. The single most generally noticeable change will be the disruption to traffic on roads in which the pipelines are installed; the psychological disruption to the community may cause general public concern over this environmental change.

F. Land Modification/Aesthetic Changes

Analysis Technique

The analysis of changes to aesthetic values involved determining the types of conflicts or opportunities for enhancement that may occur with each alternative. This was done by cross-comparing the proposed elements of the sewerage systems with the environmental elements of aesthetic value and determining the detrimental and beneficial interactions that are likely to occur.

The most significant aesthetic changes are related to one or more of the following environmental elements.

1. Terrain/Slopes.
2. Rivers and Streams.
3. Wetlands.
4. Riparian Lands.
5. Open Lands.
6. Woodlands.
7. Town Centers.
8. View Sheds.
9. Noise and Smell.

The proposed systems are comprised of the major elements that are discussed below and are the prominent land modifications which cause the environmental changes. Each is described for its inherent aesthetic modifications to the existing environment.

1. Pipelines: These leave a cleared linear corridor that is sometimes constructed in a raised berm when located in wetlands.

2. Treatment Plants: In a natural setting, these facilities create a contrasting visual change. Locations along the waterfront prevent public access to the water.

3. Outfalls: A sculptural/architectural treatment of this facility can create, to a small degree, a beneficial change.

4. Spray Irrigation Facilities: A great contrast to the landscape is created by the construction of a holding pond that may be approximately 20 feet deep.

5. Rapid Infiltration Facility: The complete transition of the landscape is made in order to provide for flat sand filtration beds with 3 to 5 foot perms surrounding them. Their size is usually 25 acres for each bed and covers between 100 and 200 acres in total area. The perimeter of the ponds may be given a free-form naturalistic treatment and, with judicious layout grading and planting design, may possibly achieve a camouflage effect if not a somewhat natural character surrounding the beds. The most dramatic and extensive changes are caused by the clearing and grading (sometimes terracing on high hills) for the beds.

6. Incineration Facilities: The unavoidable change by this facility is the smoke stack which is generally 75 feet in height.

The only beneficial change is the addition of sculptured water outfalls from treatment plants which in themselves, without the water display, make only a small change in the environment. All the other changes discussed are detrimental to a lesser or greater degree. Pumping stations have no significant visual impact on the landscape which cannot be rectified.

The analysis of the Land Modification effects on the aesthetic environment are summarized on the matrices below.

AESTHETIC DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines	X	X	X	X	X	X		X	
2. Treatment Plants		X	X	X	X	X	X	X	
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities	X				X	X		X	
5. Rapid Infiltration Facilities	X				X	X	X	X	X
6. Incineration Facilities		X					X	X	

AESTHETIC BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation		x					x	x	
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

Analysis Criteria

Changes to the aesthetic values in the environment are described by the extent and duration of the change. The various measures of these dimensions are listed on the axes of the matrices shown below. A generalized, standard rating scheme has been established among the interrelationships of these dimensions by estimating the large, moderate, and small degrees of environmental change that would occur in the environment. These criteria, as shown on the matrices below, were applied to each of the significant changes geographically identified in the study area. An environmental change may be an effect upon a natural resource, an ambient quality or character, a land use activity, or a physical facility.

DEGREES OF DETRIMENTAL CHANGE

EXTENT \ DURATION OF CHANGE	Long Term	Short Term
1. Permanent destruction (a)	L	L
2. Retrievable degradation (b)	L	M
3. Regenerable disruption (c)	M	S
4. Interfering Interruption (d)	M	S

LEGEND

L = Large
M = Moderate
S = Small

(a) Destruction may be partially alleviated through manmade efforts.
(b) Degradation may be partially retrievable through manmade efforts.
(c) Disruption may be entirely or partially regenerable through natural ecological processes.
(d) Interruptions cease when interferences are terminated.

DEGREES OF BENEFICIAL CHANGE

EXTENT \ DURATION OF EFFORT	Upon Completion of Construction	Contingent upon Additional Development
L. Unique Opportunity	L	M
2. Major Benefit	L	M
3. Minor Benefit	M	S

LEGEND

L = Large
M = Moderate
S = Small

Outlined below are types of recommendations and related cost factors involved to decrease detrimental changes or to create beneficial changes. The methods comprise the basis of the recommendation made for each of the changes identified in the analysis data presented in the following section. Each change, therefore, can be quantified by reading the conditions specified in the recommendations and applying an appropriate cost factor from the range of costs.

Types of Recommendations	Descriptive Range of Effort	Quantified Range of Cost
Land Acquisition	Minor-Moderate-Extensive	5% to 50% of originally planned acreage
Site Improvement	Minor-Moderate-Extensive	$1,000 to $20,000 per acre
Site Planning and Design	Standard Schedule of Consulting Fees	4% to 15% of construction cost
Land Restoration and Management	Careful-Rigorous	$1,000 to $10,000 per acre

Analysis Data

Utilizing the analysis matrix and criteria described above, each environmental change that was geographically located has been analyzed and described on the data sheets which follow. They are organized firstly by Alternatives 1 through 6 and secondly by numerical order of the geographic areas identified on the Location Map.

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : ONE
General Location : Beaver Brook and Double Brook
(4) Dracut, Massachusetts

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines		M		M	M	M		M	
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term and short-term disruption and degradation to natural riverscape and adjacent landscape. Viewed from Mammoth Road and River Brook. Mostly regenerable, but some areas likely to be only retrievable with careful land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS

Alternative Number : ONE

General Location : Concord River

(7) Billerica, Massachusetts

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities							S	M	

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: Long-term degradation to natural skyline, riverscape, and landscape, viewed from river and local roads.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : ONE
General Location : Duck Island, Merrimack River
(8) Lowell, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants		L		M		L	L	L	
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities							M	M	

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Permanent destruction of natural character on island and degradation of riverscape. Viewed from scenic riverfront road (Merrimack Avenue) and City of Lowell.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation		M					M	M	
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Potential opportunity of water sculpture at outfall if provided moderate site improvements and creative design. Potentially viewed from city, riverfront, highways, and waterways.

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : ONE
General Location : Hales Island, Merrimack River
(10) Haverhill, Massachusetts

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants		L	L		L	L		L	
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities								M	

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term degradation of existing character of site, riverscape, and adjacent landscape by treatment plant. Viewed from river, riverfront road (Water Street) and town. Partially retrievable or modified through sensitive site, architectural, grading, and planting design.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation		M					M	M	
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Potential possibility of water sculpture at outfall if provided moderate site improvements and creative design. Potentially viewed from city, riverfront, and water ways.

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : ONE
General Location : Meadow River, Millvale Reservoir
(13) Haverhill, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines	M	L	L	L		L			
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term disruption and likely degradation to natural wetland or lake character. Possibly regenerable; retrievable through sensitive design, construction, and land restoration/ management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : ONE
General Location : Merrimack River
(16) Newburyport, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants		L		L			L	L	
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities		L					L	L	

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Degradation of riverscape viewed from river, highway (Rte 1A) and town. Partially retrievable through strategic layout and sensitive site, architectural and planting design.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : ONE
General Location : Brown's Point
(17) Salisbury, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines		M	L			L		L	
2. Treatment Plants			L		L			L	
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term degradation of marshland landscape character. Viewed from Merrimack River and Salisbury Beach State Park. Relocation of Treatment Plant into woodland is recommended. Present site partially retrievable through strategic location and sensitive site, architectural, and planting design. Pipe lines in marshland are likely to leave a permanent man-made scar on the land.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : ONE
General Location : Unkety Brook and Flint Pond Tributary
(23) Dunstable, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines			L	L	M				
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term / short term disruption and degradation of natural landscape character. Partially regenerable and retreivable through strategic location, sensitive site and planting design, and careful land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS

Alternative Number : ONE

General Location : Parker River Headwaters, West Boxford Village

(25) Boxford, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines				L	L				
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: Long-term/short-term disruption and degradation of natural landscape character. Viewed from roads and surrounding buildings. Partially regenerable and retrievable through sensitive location and planting design, and careful land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : ONE
General Location : Sand Creek
(26) Rowley, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines			L						
2. Treatment Plants			L		L	L			
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term to short-term disruption and degradation of landscape character. Partially regenerable and retrievable through sensitive location, site; architectural and planting design, and careful land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : TWO
General Location : Beaver Brook and Double Brook
(4) Dracut, Massachusetts

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (Image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines		M		M	M	M		M	
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term and short-term disruption and degradation to natural riverscape and adjacent landscape. Viewed from Mammoth Road and River Brook. Mostly regenerable, but some areas likely to be only retrievable with careful land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (Image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : TWO
General Location : Duck Island, Merrimack River
(8) Lowell, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants		L		M		L	L	L	
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities							M	M	

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Permanent destruction of natural character on island and degradation of riverscape. Viewed from scenic riverfront road (Merrimack Avenue) and City of Lowell.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation		M					M	M	
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Potential opportunity of water sculpture at outfall if provided moderate site improvements and creative design. Potentially viewed from city, riverfront, highways, and waterways.

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : TWO
General Location : Hales Island, Merrimack River
(10) Haverhill, Massachusetts

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants		L	L		L	L		L	
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities								M	

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term degradation of existing character of site, riverscape, and adjacent landscape by treatment plant. Viewed from river, riverfront road (Water Street) and town. Partially retrievable or modified through sensitive site, architectural, grading, and planting design.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation		M					M	M	
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Potential possibility of water sculpture at outfall if provided moderate site improvements and creative design. Potentially viewed from city, riverfront, and water ways.

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : TWO
General Location : Brown's Point
(17) Salisbury, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines		M	L			L		L	
2. Treatment Plants			L		L			L	
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term degradation of marshland landscape character. Viewed from Merrimack River and Salisbury Beach State Park. Relocation of Treatment Plant into woodland is recommended. Present site partially retrievable through strategic location and sensitive site, architectural, and planting design. Pipe lines in marshland are likely to leave a permanent man-made scar on the land.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : TWO
General Location : Unkety Brook and Flint Pond Tributary
(23) Dunstable, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (Image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines			L	L	M				
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term / short term disruption and degradation of natural landscape character. Partially regenerable and retreivable through strategic location, sensitive site and planting design, and careful land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (Image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : TWO
General Location : Parker River Headwaters, West Boxford Village
(25) Boxford, MA

DETRIMENTAL CHANGES

ENVIRONMENTAL ELEMENT / PROPOSED ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines				L	L				
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term/short-term disruption and degradation of natural landscape character. Viewed from roads and surrounding buildings. Partially regenerable and retrievable through sensitive location and planting design, and careful land restoration and management.

BENEFICIAL CHANGES

ENVIRONMENTAL ELEMENT / PROPOSED ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : THREE
General Location : Beaver Brook and Double Brook
(4) Dracut, Massachusetts

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines		M		M	M	M		M	
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term and short-term disruption and degradation to natural riverscape and adjacent landscape. Viewed from Mammoth Road and River Brook. Mostly regenerable, but some areas likely to be only retrievable with careful land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS

Alternative Number : THREE

General Location • : Unkety Brook and Flint Pond Tributary

(23) Dunstable, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines			L	L	M				
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: Long-term / short term disruption and degradation of natural landscape character. Partially regenerable and retreivable through strategic location, sensitive site and planting design, and careful land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : THREE
General Location : Parker River Headwaters, West Boxford Village
(25) Boxford, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines				L	L				
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term/short-term disruption and degradation of natural landscape character. Viewed from roads and surrounding buildings. Partially regenerable and retrievable through sensitive location and planting design, and careful land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FOUR
General Location : Beaver Brook and Double Brook
(4) Dracut, Massachusetts

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines		M		M	M	M		M	
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term and short-term disruption and degradation to natural riverscape and adjacent landscape. Viewed from Mammoth Road and River Brook. Mostly regenerable, but some areas likely to be only retrievable with careful land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FOUR
General Location : Duck Island, Merrimack River
(8) Lowell, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants		L		M		L	L	L	
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities							M	M	

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Permanent destruction of natural character on island and degradation of riverscape. Viewed from scenic riverfront road (Merrimack Avenue) and City of Lowell.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation		M					M	M	
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Potential opportunity of water sculpture at outfall if provided moderate site improvements and creative design. Potentially viewed from city, riverfront, highways, and waterways.

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FOUR
General Location : Hales Island, Merrimack River
(10) Haverhill, Massachusetts

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants		L	L		L	L		L	
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities								M	

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term degradation of existing character of site, riverscape, and adjacent landscape by treatment plant. Viewed from river, riverfront road (Water Street) and town. Partially retrievable or modified through sensitive site, architectural, grading, and planting design.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation		M					M	M	
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Potential possibility of water sculpture at outfall if provided moderate site improvements and creative design. Potentially viewed from city, riverfront, and water ways.

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FOUR
General Location : Meadow River, Millvale Reservoir
(13) Haverhill, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines	M	L	L	L		L			
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term disruption and likely degradation to natural wetland or lake character. Possibly regenerable; retrievable through sensitive design, construction, and land restoration/ management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS

Alternative Number : FOUR

General Location : Merrimack River

(16) Newburyport, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation		M					M	M	
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: Potential opportunity of water sculpture at outfall, if provided moderate site improvements and creative design. Potentially viewed from city, riverfront, and river waterways.

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FOUR
General Location : Penn Brook
(22) Georgetown, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines		L	L	L	S			L	
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term/short term disruption and degradation of natural landscape character. Viewed from roads and residential areas. Partially retrievable through strategic location, sensitive site and planting design, and careful land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS

Alternative Number : FOUR

General Location : Unkety Brook and Flint Pond Tributary

(23) Dunstable, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines			L	L	M				
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: Long-term / short term disruption and degradation of natural landscape character. Partially regenerable and retreivable through strategic location, sensitive site and planting design, and careful land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FOUR
General Location : Parker River Headwaters, West Boxford Village
(25) Boxford, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines				L	L				
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term/short-term disruption and degradation of natural landscape character. Viewed from roads and surrounding buildings. Partially regenerable and retrievable through sensitive location and planting design, and careful land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS

Alternative Number : FOUR

General Location : South Bank, Merrimack River

(29) Andover, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines	M	L			M	L		L	
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: Long-term/short term degradation and disruption to natural river-scape character (6± miles). Viewed from river and trails. Partially regenerable with long-term natural process and partially retreivable through sensitive location and planting design and careful land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FIVE
General Location : Fort Devens Reservation
(1) Lancaster, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities	L					L		L	S
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Permanent destruction of existing woodland character (460±acres). Viewed from Prospect Hill Road (Rte. 110); partially alleviated through strategic layout, sensitive site, grading, and planting design, and rigorous land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS

Alternative Number : FIVE

General Location : Nashua River and Tributary Streams

(3) Pepperell, Massachusetts

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines		M		L	M	L			
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities	L				L	L		L	
6. Incineration Facilities									

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: Pipe Lines - Long-term and short-term disruption and degradation to natural character of riverscape. Some areas partially regenerable, others partially retrievable through sensitive siting, grading, and planting design.
Rapid Infiltration Facilities - Permanent destruction of natural landscape character (320+-acres); partially alleviated through strategic layout, sensitive site, grading, and planting design, and rigorous land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FIVE
General Location : Beaver Brook and Double Brook
(4) Dracut, Massachusetts

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines		M		M	M	M		M	
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term and short-term disruption and degradation to natural riverscape and adjacent landscape. Viewed from Mammoth Road and River Brook. Mostly regenerable, but some areas likely to be only retrievable with careful land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FIVE
General Location : Routes 495 and 225
(6) Westford, Massachusetts

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants					L			L	
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities	L				L	L		L	
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Treatment Plant - Long-term degradation of open space integrity and existing landscape character. Viewed from ski slope, Rte 495, Rte 225 and local roads. Partially retreivable through sensitive site, architecture and planting design. Spray Irrigation - disruption of natural landscape character (630+ acres); partially alleviated through strategic layout, sensitive site, grading, and planting design, and rigorous land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FIVE
General Location : Duck Island, Merrimack River
(8) Lowell, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants		L		M		L	L	L	
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities							M	M	

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Permanent destruction of natural character on island and degradation of riverscape. Viewed from scenic riverfront road (Merrimack Avenue) and City of Lowell.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation		M					M	M	
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Potential opportunity of water sculpture at outfall if provided moderate site improvements and creative design. Potentially viewed from city, riverfront, highways, and waterways.

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FIVE
General Location : Hales Island, Merrimack River
(10) Haverhill, Massachusetts

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants		L	L		L	L		L	
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities	L				L	L		L	
6. Incineration Facilities								M	

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term degradation of existing character of site, riverscape, and adjacent landscape by treatment plant and rapid infiltration facility. Viewed from river, riverfront road (Water Street) and town. Partially retrievable or modified through sensitive site, architectural, grading, and planting design, and rigorous land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FIVE
General Location : Littles Hill and Village of Marlboro
(11) Georgetown, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants					L		L		
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities	L					L			
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Treatment Plant - Long-term degradation of open space integrity and natural landscape character. Viewed from Village center and road. Partially retrievable with sensitive site, architectural, and planting design.
Spray Irrigation Facilities - disruption of existing landscape character (460±acres); partially alleviated through strategic layout, sensitive site, grading, and planting design, and rigorous land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FIVE
General Location (12) : Hunsley Hills area north
Rowley, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants					L				
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities						M			
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Treatment Plant - Long-term degradation of open space integrity and natural character of area. Viewed from local streets. Partially retreivable with sensitive site, architectural, and planting design.
Spray Irrigation - disruption of natural landscape character (320+ acres); partly alleviated through strategic layout, sensitive site, grading, and planting design, and rigorous land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FIVE
General Location : Meadow River, Millvale Reservoir
(13) Haverhill, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines	M	L	L	L		L			
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term disruption and likely degradation to natural wetland or lake character. Possibly regenerable; retrievable through sensitive design, construction, and land restoration/ management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FIVE
General Location : Docks Bridge
(14) West Newbury, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants		M			L			L	
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term degradation of open space character and natural riverscape. Viewed from river and road (Bridge Street). Partially retrievable through strategic location and sensitive site, architectural and planting design.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FIVE
General Location : Indian River
(15) West Newbury, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines	L	L			L	L			
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities	M				L	L			
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Pipe lines - long term degradation to natural landscape character. Viewed from road. Retrievable through strategic layout and sensitive site and planting design. Spray Irrigation - disruption of natural landscape character (270+ acres): partially alleviated through strategic layout, sensitive site, grading, and planting design, and rigorous land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FIVE
General Location : Merrimack River
(16) Newburyport, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants		L		L			L	L	
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities		L					L	L	

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Degradation of riverscape and community image viewed from river, highway (Rte 1A) and town. Partially retrievable through strategic layout and sensitive site, architectural and planting design.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FIVE
General Location : Brown's Point
(17) Salisbury, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines		M	L			L		L	
2. Treatment Plants			L		L			L	
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term degradation of marshland landscape character. Viewed from Merrimack River and Salisbury Beach State Park. Relocation of Treatment Plant into woodland is recommended. Present site partially retrievable through strategic location and sensitive site, architectural, and planting design. Pipe lines in marshland are likely to leave a permanent man-made scar on the land.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS

Alternative Number : FIVE

General Location : Great Meadows, Concord River

(18) Concord, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines		L	L	L	L				
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: Long-term degradation and possible destruction to portions of natural landscape character. Viewed from trails, river, and roads. Retrievable through sensitive location, siting, and planting design and rigorous land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FIVE
General Location : Stoney Brook and Beaver Brook
(19) Westford, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines	L	L	L	L	M	L	M	M	
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term degradation of stream/ pond/wetland landscape. Associated pumping stations are likely to have high visual contrast in locations near roads and in open areas. Viewed from housing, roads, town center. Retreivable through sensitive location and planting design and careful land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FIVE
General Location : Parker River Headwaters, West Boxford Village
(25) Boxford, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines				L	L				
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term/short-term disruption and degradation of natural landscape character. Viewed from roads and surrounding buildings. Partially regenerable and retrievable through sensitive location and planting design, and careful land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FIVE
General Location : Fairhaven Hill, Sudbury River
(27) Concord, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities	L					L			
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term degradation and permanent destruction of natural character of landforms and forest. Viewed from river and surrounding roads. Partially retrievable through sensitive site, grading, and planting design, and rigorous land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FIVE
General Location : Route 3 opposite Flint Pond
(33) Tyngsborough, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities	M				L	L		L	
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Permanent destruction of existing landscape character (210± acres). Viewed from Route 3 and local roads. Partially alleviated if provided with strategic layout, sensitive site, grading, and planting design, and rigorous land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FIVE
General Location : Haverhill - Riverside Airport Area
(34) Haverhill, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities	M				L	L		L	
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Permanent destruction of existing landscape character (220 acres). Viewed from local roads. Partially alleviated if provided strategic layout, sensitive site, grading, and planting, and rigorous land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : SIX
General Location (12) : Hunsley Hills area north
Rowley, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants					L				
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities						M			
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Treatment Plant - Long-term degradation of open space integrity and natural character of area. Viewed from local streets. Partially retreivable with sensitive site, architectural, and planting design.
Spray Irrigation - disruption of natural landscape character (320+ acres); partly alleviated through strategic layout, sensitive site, grading, and planting design, and rigorous land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : SIX
General Location : Meadow River, Millvale Reservoir
(13) Haverhill, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines	M	L	L	L		L			
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term disruption and likely degradation to natural wetland or lake character. Possibly regenerable; retrievable through sensitive design, construction, and land restoration/ management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : SIX
General Location : Indian River
(15) West Newbury, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines	L	L			L	L			
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities	M				L	L			
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Pipe lines - long term degradation to natural landscape character. Viewed from road. Retrievable through strategic layout and sensitive site and planting design. Spray Irrigation - permanent destruction of natural landscape character (570±acres): partially alleviated through strategic layout, sensitive site, grading, and planting design, and rigorous land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : SIX
General Location : Brown's Point
(17) Salisbury, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines		M	L			L		L	
2. Treatment Plants			L		L			L	
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term degradation of marshland landscape character. Viewed from Merrimack River and Salisbury Beach State Park. Relocation of Treatment Plant into woodland is recommended. Present site partially retrievable through strategic location and sensitive site, architectural, and planting design. Pipe lines in marshland are likely to leave a permanent man-made scar on the land.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : SIX
General Location : Johnson's Creek tributaries
(20) Groveland, Ma

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines		L	L	L		L			
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities	L				L	L		L	
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Pipe-Lines - Long-term disruption and likely degradation of natural landscape character along stream. (1.5+ mile). Partially retrievable through strategic location and sensitive site and planting design.
Rapid Infiltration - Permanent destruction of natural landscape character (310+ acres); partially alleviated through strategic layout, sensitive site, grading, and planting design, and rigorous land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : SIX
General Location : Penn Brook
(22) Georgetown, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (Image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines		L	L	L	S			L	
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term/short term disruption and degradation of natural landscape character. Viewed from roads and residential areas. Partially retrievable through strategic location, sensitive site and planting design, and careful land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (Image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : SIX
General Location : Parker River Headwaters, West Boxford Village
(25) Boxford, MA

DETRIMENTAL CHANGES

ENVIRONMENTAL ELEMENT / PROPOSED ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines				L	L				
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term/short-term disruption and degradation of natural landscape character. Viewed from roads and surrounding buildings. Partially regenerable and retrievable through sensitive location and planting design, and careful land restoration and management.

BENEFICIAL CHANGES

ENVIRONMENTAL ELEMENT / PROPOSED ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : SIX
General Location : Stills Pond
(28) Boxford, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (Image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities	M				L	L		L	
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Disruption of natural landscape character (450+ acres); partially alleviated through strategic layout, sensitive site, grading, and planting design, and rigorous land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (Image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : SIX
General Location : Powwow River at Rte 495 and Lone Tree Hill
(31) Amesbury, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants					L		L	L	
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities	L				L	L	L	L	
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Permanent destruction to existing landscape character. Partially alleviated through strategic layout, sensitive site, architecture, grading, and planting design.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : SIX
General Location : Elm Street
(32) Salisbury, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities	L				L	L	L	L	
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Permanent destruction to existing landscape character. Viewed from Interstate Rte 95 and Elm Street. Partially retrievable through strategic layout, sensitive site, grading and planting design.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : SIX
General Location : Haverhill - Riverside Airport Area
(34) Haverhill, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities	M				L	L		L	
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Permanent destruction of existing landscape character (220 acres). Viewed from local roads. Partially alleviated if provided strategic layout, sensitive site, grading, and planting, and rigorous land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Interest Groups Affected

The various categories of interest groups are identified below and compared to the possible aesthetic changes that may occur. It is expected that all groups would have a general consensus of concerns for:

- Preservation and enhancement of the natural landscape and riverscape character.
- Protection and conservation of wetlands, open lands and woodlands.
- Protection and enhancement of the community image.

AESTHETIC CHANGES

ENVIRONMENTAL ELEMENT / PROPOSED ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines	X		X		X	X		X	
2. Treatment Plants		X	X	X	X	X	X	X	X
3. Outfalls & Flow Augmentation		X						X	X
4. Spray Irrigation Facilities	X				X	X	X	X	
5. Rapid Infiltration Facilities	X				X	X	X	X	X
6. Incineration Facilities		X					X	X	

INTEREST GROUPS

a. Unorganized Groups	b. Organized Groups	c. Local Government	d. Regional Government	e. State Government	f. Federal Government
X	X	X	X	X	X
X	X	X	X	X	X
X	X	X			
X	X	X		X	X
X	X	X		X	X
X	X	X			

G. Operations/Aesthetic Changes

No operations are expected to significantly affect the aesthetic values of the environment either detrimentally or beneficially.

VI. CULTURAL VALUES

The study of cultural values in the environment is a consideration of the change the alternative sewerage systems may cause to existing cultural institutions and their lands. Described below and listed by the various possible effects of the systems are the changes that are likely to occur in the cultural environment.

A. Water Quality/Cultural Changes

No significant changes are expected to occur that will affect cultural values either detrimentally or beneficially.

B. Water Supply/Cultural Changes

No significant changes are expected to occur that will affect cultural values either detrimentally or beneficially.

C. Collection System/Cultural Changes

No significant changes are expected to occur that will affect cultural values either detrimentally or beneficially.

D. Treatment Products/Cultural Changes

No significant changes are expected to occur that will affect cultural values either detrimentally or beneficially.

E. Construction/Cultural Changes

No significant changes are expected to occur that will affect cultural values either detrimentally or beneficially.

F. Land Modification/Cultural Changes

Analysis Technique

The analysis of changes to cultural values involved determining the types of conflicts or opportunities for enhancement that may occur with each alternative. This was done by cross-comparing the proposed elements of the sewerage systems with the environmental elements of cultural value and determining the detrimental and beneficial interactions that are likely to occur.

The most significant cultural changes are related to one or more of the following environmental elements.

1. Historic Neighborhoods.
2. Historic Settings.
3. Educational Institutions.
4. Seminaries.
5. Cemeteries.

The elements of the proposed systems and the cultural environment are listed on the axes of the matrix below. The kinds of land modification that characteristically occur are a degrading of prominent views or of adjacent high quality settings and possibly in a few cases the use of some institutional lands. Changes to the environment are exclusively detrimental in nature to one degree or another. The pumping stations and outfalls of the sewerage system create no change of significant magnitude.

CULTURAL DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemeteries
1. Pipe Lines	X	X	X	X	
2. Treatment Plants		X			X
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities		X	X	X	X
5. Rapid Infiltration Facilities		X	X	X	X
6. Incineration Facilities		X			

Analysis Criteria

Changes to the cultural values in the environment are described by the extent and duration of the change. The various measures of these dimensions are listed on the axes of the matrices shown below. A generalized, standard rating scheme has been established among the interrelationships of these dimensions by estimating the large, moderate, and small degrees of environmental change that would occur in the environment. These criteria, shown on the matrices below, were applied to each of the significant changes geographically identified in the study area. An environmental change may be an effect upon a natural resource, an ambient quality or character, a land use activity, or a physical facility.

DEGREES OF DETRIMENTAL CHANGE

EXTENT \ DURATION OF CHANGE	Long Term	Short Term
1. Permanent destruction (a)	L	L
2. Retrievable degradation (b)	L	M
3. Regenerable disruption (c)	M	S
4. Interfering Interruption (d)	M	S

LEGEND

L = Large
M = Moderate
S = Small

(a) Destruction may be partially alleviated through manmade efforts.
(b) Degradation may be partially retrievable through manmade efforts.
(c) Disruption may be entirely or partially regenerable through natural ecological processes.
(d) Interruptions cease when interferences are terminated.

DEGREES OF BENEFICIAL CHANGE

EXTENT \ DURATION OF EFFORT	Upon Completion of Construction	Contingent upon Additional Development
L. Unique Opportunity	L	M
2. Major Benefit	L	M
3. Minor Benefit	M	S

LEGEND

L = Large
M = Moderate
S = Small

Outlined below are types of recommendations and related cost factors involved to decrease detrimental changes or to create beneficial changes. The methods comprise the basis of the recommendation made for each of the changes identified in the analysis data presented in the following section. Each change, therefore, can be quantified by reading the conditions specified in the recommendations and applying an appropriate cost factor from the range of costs.

Types of Recommendations	Descriptive Range of Effort	Quantified Range of Cost
Land Acquisition	Minor-Moderate-Extensive	5% to 50% of originally planned acreage
Site Improvement	Minor-Moderate-Extensive	$1,000 to $20,000 per acre
Site Planning and Design	Standard Schedule of Consulting Fees	4% to 15% of construction cost
Land Restoration and Management	Careful-Rigorous	$1,000 to $10,000 per acre

Analysis Data

Utilizing the analysis matrix and criteria described above, each environmental change that was geographically located has been analyzed and described on the data sheets which follow. They are organized firstly by Alternatives 1 through 6 and secondly by numerical order of geographic areas identified on the Location Map.

Type of Environmental Change: LAND MODIFICATION / CULTURAL
Alternative Number : ONE
General Location : Meadow River
(13) Haverhill, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemeteries
1. Pipe Lines		M			M
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Children of Israel Church - Possible short-term disruption and/or long-term degradation of church view and setting. Partially retreivable through strategic location and sensitive site and planting design.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemeteries
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / CULTURAL

Alternative Number : SIX

General Location : Parker River headquarters, West Boxford Village

(25) Boxford, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemeteries
1. Pipe Lines					M
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: Brookside Cemetery - Possible short-term to long-term disruption and degradation to setting of and views from the cemetery. Partially retrievable by strategic location and sensitive site and planting design.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemeteries
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / CULTURAL
Alternative Number : THREE
General Location : Meadow River
(13) Haverhill, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemeteries
1. Pipe Lines		M			M
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Children of Israel Church - Possible short-term disruption and/or long-term degradation of church view and setting. Partially retreivable through strategic location and sensitive site and planting design.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemeteries
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / CULTURAL
Alternative Number : THREE
General Location : Parker River headquarters, West Boxford Village
(25) Boxford, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemeteries
1. Pipe Lines					M
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Brookside Cemetery - Possible short-term to long-term disruption and degradation to setting of and views from the cemetery. Partially retrievable by strategic location and sensitive site and planting design.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemeteries
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / CULTURAL

Alternative Number : FIVE

General Location : Dock Bridge, Merrimack River

(14) West Newbury, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemetaries
1. Pipe Lines					
2. Treatment Plants					M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: Bridge Street Cemetery - Long-term degradation to cemetery view and setting. Partially retrievable through strategic location and sensitive site, architecture, and planting design.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemetaries
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / CULTURAL
Alternative Number : FIVE
General Location : Indian River
(15) West Newbury, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemetaries
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities		L	L		
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Cardinal Cushing Academy - Permanent destruction of academy view and surrounding setting (270±acres). Effects partially limited through strategic layout, sensitive site, grading, and planting design, and rigorous land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemetaries
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / CULTURAL
Alternative Number : FOUR
General Location : Parker River headquarters, West Boxford Village
(25) Boxford, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemetaries
1. Pipe Lines					M
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Brookside Cemetery - Possible short-term to long-term disruption and degradation to setting of and views from the cemetery. Partially retrievable by strategic location and sensitive site and planting design.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemetaries
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / CULTURAL
Alternative Number : FIVE
General Location : Fairhaven Hill, Sudbury River
(27) Concord, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemeteries
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities	L	L			
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Walden Pond - Permanent destruction of natural landscape setting adjacent to the Reservation lands which are of national significance. Facilities possibly seen from the Reservation lands; partially alleviated by strategic location, sensitive site, grading, and planting design, and rigorous land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemeteries
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / CULTURAL
Alternative Number : SIX
General Location : Meadow River
(13) Haverhill, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemeteries
1. Pipe Lines		M			M
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Children of Israel Church - Possible short-term disruption and/or long-term degradation of church view and setting. Partially retreivable through strategic location and sensitive site and planting design.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemeteries
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / CULTURAL
Alternative Number : SIX
General Location : Indian River
(15) West Newbury, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemeteries
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities		L	L		
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Cardinal Cushing Academy - Permanent destruction of academy view and surrounding setting (570±acres). Effects partially limited through strategic layout, sensitive site, grading, and planting design, and rigorous land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemeteries
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / CULTURAL

Alternative Number : SIX

General Location : Johnson Creek tributaries

(20) Groveland, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemetaries
1. Pipe Lines			M		
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: Bagnall School - Short term disruption and likely long-term degradation to existing site character along creek. Partially retrievable by strategic location and sensitive site and planting design.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemetaries
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / CULTURAL

Alternative Number : FIVE

General Location : Parker River headquarters, West Boxford Village

(25) Boxford, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemeteries
1. Pipe Lines					M
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: Brookside Cemetery - Possible short-term to long-term disruption and degradation to setting of and views from the cemetery. Partially retrievable by strategic location and sensitive site and planting design.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemeteries
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

Interest Groups Affected

The various categories of interest groups are identified below and compared to the possible cultural changes that may occur. As shown on the matrix, it is expected that all groups would have a general consensus to preserve the lands, settings, and views from the cultural institutions within the study area.

CULTURAL CHANGES

PROPOSED ELEMENT / ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemeteries
1. Pipe Lines	X	X	X	X	
2. Treatment Plants		X			X
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities		X	X	X	X
5. Rapid Infiltration Facilities		X	X	X	X
6. Incineration Facilities		X			

INTEREST GROUPS

	a. Unorganized Groups	b. Organized Groups	c. Local Government	d. Regional Government	e. State Government	f. Federal Government
1. Pipe Lines		X	X			X
2. Treatment Plants	X	X	X	X	X	
3. Outfalls & Flow Augmentation						
4. Spray Irrigation Facilities		X	X	X		
5. Rapid Infiltration Facilities		X	X	X		X
6. Incineration Facilities		X	X			

G. Operations/Cultural Changes

No operations are expected to significantly affect the cultural values of the environment either detrimentally or beneficially.

VII. INTEREST GROUP CONSTITUENCIES

A. Unorganized Groups.

1. Abutting owner.
2. Surrounding residents.
3. Town citizenry.
4. Recreators: fishermen, boaters, hikers.

B. Organized Groups.

1. Conservation groups.
2. Garden clubs.
3. Sport clubs.
4. Historical/preservation societies.

C. Local Government (Cities, Towns and Counties).

1. Board of Selectmen.
2. Planning Board.
3. Conservation Commission.
4. Parks and Recreation Commissions.

D. Regional Government.

1. Northern Middlesex Area Commission.
2. Merrimack Valley Area Commission.
3. New England River Basins Commission.
4. Greater Lawrence Sanitary District.
5. Lower Sanitary District.

E. State Government.

1. Economic Development Division, DCD*
2. Tourism Division, DCD.
3. Department of Community Affairs.
4. Executive Office of Environmental Affairs.
5. Conservation Services Division, DNR**
6. Environmental Protection, DNR.
7. Fisheries and Game Division, DNR.
8. Forest Development, DNR.
9. Marine Fisheries Division, DNR.
10. Parks and Recreation, DNR.

*Department of Commerce and Development
**Department of Natural Resources

11. Water Pollution Division, DNR.
12. Water Resources Division, DNR.
13. Wetlands Protection Division, DNR.

F. Federal Government.

1. Corps of Engineers, U.S. Army.
2. U.S. Environmental Protection Agency.
3. Fish and Wildlife Service, U.S. Department of Interior.
4. National Park Service, U.S. Department of Interior.
5. U.S. Water Resources Council.

VIII. TOWN RECOMMENDATIONS

A. Recommendations for the Town of Pepperell.

1. Pipelines. Extend the pipeline turnoff that runs north from Lowell Road to the west side of Reedy Meadow Brook to avoid crossing brook.

2. Rapid Infiltration. Omit this method of disposal or provide additional funds necessary for land acquisition, site improvements, consultant site planning and design services, and land restoration and management.

C. Recommendations for the Town of Tyngsborough.

1. Rapid Infiltration. Omit this method of disposal or provide additional funds necessary for consultant site planning and design services, and land restoration and management.

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FIVE
General Location : Route 3 opposite Flint Pond
(33) Tyngsborough, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities	M				L	L		L	
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Permanent destruction of existing landscape character (210± acres). Viewed from Route 3 and local roads. Partially alleviated if provided with strategic layout, sensitive site, grading, and planting design, and rigorous land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FIVE
General Location : Route 3 opposite Flint Pond
Tyngsborough, MA

(33)

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities		M			
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity if provided with minor acquisition (5% or 10± acres), moderate site improvements, and sensitive site, grading and planting design.

D. Recommendations for the Town of Dracut.

1. Pipelines. Provide additional funds necessary for consultant site planning and design services, and land restoration and management.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : THREE
General Location : Beaver Brook and Double Brook
(4) Dracut, MA

DETRIMENTAL CHANGES

ENVIRONMENTAL ELEMENT / PROPOSED ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

ENVIRONMENTAL ELEMENT / PROPOSED ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines	M		M		
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity with Pipe Lines (1.5+miles appropor-tionately) if provided, strategic location and sensitive site and planting design.

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : THREE
General Location : Beaver Brook and Double Brook
(4) Dracut, Massachusetts

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines		M		M	M	M		M	
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term and short-term disruption and degradation to natural riverscape and adjacent landscape. Viewed from Mammoth Road and River Brook. Mostly regenerable, but some areas likely to be only retrievable with careful land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

E. Recommendations for the City of Lowell.

1. Outfall. Provide additional funds necessary for site improvements and consultant design services.

2. Treatment Plant. Relocate out of view from river and provide additional funds necessary for land acquisition, site improvements, consultant site planning and design services, and land restoration and management.

3. Incineration. Omit this method of disposal to eliminate smoke stack.

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : THREE
General Location : Duck Island, Merrimack River
(8) Lowell, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (Image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants		L		M		L	L	L	
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities							M	M	

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Permanent destruction of natural character on island and degradation of riverscape. Viewed from scenic riverfront road (Merrimack Avenue) and City of Lowell.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (Image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation		M					M	M	
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Potential opportunity of water sculpture at outfall if provided moderate site improvements and creative design. Potentially viewed from city, riverfront, highways, and waterways.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : THREE
General Location : Duck Island, Merrimack River
(8) Lowell, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants				M	M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: POTENTIAL opportunity if provided with minor acquisition and moderate site improvements.

F. Recommendations for the City of Haverhill.

1. Pipelines. Provide additional funds necessary for consultant site planning and design services, and land restoration and management.

2. Treatment Plant. Provide funds necessary for land acquisition, site improvements, and consultant site planning and design services.

3. Incineration. Omit this method of disposal to eliminate smoke stack.

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FIVE
General Location : Hales Island, Merrimack River
(10) Haverhill, Massachusetts

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants		L	L		L	L		L	
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities	L				L	L		L	
6. Incineration Facilities								M	

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term degradation of existing character of site, riverscape, and adjacent landscape by treatment plant and rapid infiltration facility. Viewed from river, riverfront road (Water Street) and town. Partially retrievable or modified through sensitive site, architectural, grading, and planting design, and rigorous land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : FIVE
General Location : Hales Island, Merrimack River
(10) Haverhill, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					L
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities		M			S
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Potential Opportunity under the following conditions: Rapid Infiltration Facilities (Alternative 5 and 6 only): if provided extensive acquisition (25% or 55± acres), moderate site improvements, strategic location, sensitive site, grading and planting design, and rigorous land restoration and management. Treatment Plant: if moderate to extensive acquisition and improvements provided with moderate acquisition and site improvements,

Type of Environmental Change: LAND MODIFICATION / RECREATION

Alternative Number : FIVE

General Location : Meadow River and Millvale Reservoir

(13) Haverhill, MA

DETRIMENTAL CHANGES

ENVIRONMENTAL ELEMENT / PROPOSED ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

BENEFICIAL CHANGES

ENVIRONMENTAL ELEMENT / PROPOSED ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines	M				
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: Opportunity to create a path system to increase exposure to water for over approximately 3 miles, connections to Northern Essex Community College, Millvale Reservoir, Merrimack River, and (with Alternatives nos. 5 and 6 only) potential park at rapid infiltration area.

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FIVE
General Location : Haverhill - Riverside Airport Area
(34) Haverhill, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities	M				L	L		L	
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Permanent destruction of existing landscape character (220 acres). Viewed from local roads. Partially alleviated if provided strategic layout, sensitive site, grading, and planting, and rigorous land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / RECREATION

Alternative Number : FIVE

General Location : Haverhill - Riverside Airport area

(34) Haverhill, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities		M			
6. Incineration Facilities					

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: POTENTIAL opportunity if provided with minor acquisition (5% or 11± acres), moderate site improvements, and sensitive site, grading, and planting design.

G. Recommendations for the Town of Groveland.

1. Pipelines. Provide additional funds necessary for consultant site planning and design services and land restoration and management.

2. Rapid Infiltration. Omit this method of disposal or provide additional funds necessary for land acquisition, site improvements, consultant site planning and design services, and land restoration and management.

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : FIVE
General Location : Johnson's Creek tributaries
(20) Groveland, Ma

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (Image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines		L	L	L		L			
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities	L				L	L		L	
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Pipe-Lines - Long-term disruption and likely degradation of natural landscape character along stream. (1.5+ mile). Partially retrievable through strategic location and sensitive site and planting design.
Rapid Infiltration - Permanent destruction of natural landscape character (310 ±acres); partially alleviated through strategic layout, sensitive site, grading, and planting design, and rigorous land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (Image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / CULTURAL
Alternative Number : FIVE
General Location : Johnson Creek tributaries
(20) Groveland, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemetaries
1. Pipe Lines			M		
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Bagnall School - Short term disruption and likely long-term degradation to existing site character along creek. Partially retrievable by strategic location and sensitive site and planting design.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemetaries
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS
Alternative Number : THREE
General Location : Parker River Headwaters, West Boxford Village
(25) Boxford, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines				L	L				
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Long-term/short-term disruption and degradation of natural landscape character. Viewed from roads and surrounding buildings. Partially regenerable and retrievable through sensitive location and planting design, and careful land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / CULTURAL
Alternative Number : THREE
General Location : Parker River headquarters, West Boxford Village
(25) Boxford, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT / ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemeteries
1. Pipe Lines					M
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Brookside Cemetery - Possible short-term to long-term disruption and degradation to setting of and views from the cemetery. Partially retrievable by strategic location and sensitive site and planting design.

BENEFICIAL CHANGES

PROPOSED ELEMENT / ENVIRONMENTAL ELEMENT	a. Historic Neighborhoods	b. Historic Settings	c. Educational Institutions	d. Seminaries	e. Cemeteries
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

I. Recommendations for the Town of Georgetown.

1. Pipelines. Provide additional funds necessary for consultant site planning and design services, and land restoration and management.

Type of Environmental Change: LAND MODIFICATION / AESTHETICS

Alternative Number : THREE

General Location : Penn Brook

(22) Georgetown, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines		L	L	L	S			L	
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: Long-term/short term disruption and degradation of natural landscape character. Viewed from roads and residential areas. Partially retrievable through strategic location, sensitive site and planting design, and careful land restoration and management.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / AESTHETICS

Alternative Number : ONE

General Location : Brown's Point

(17) Salisbury, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines		M	L			L		L	
2. Treatment Plants			L		L			L	
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description: Long-term degradation of marshland landscape character. Viewed from Merrimack River and Salisbury Beach State Park. Relocation of Treatment Plant into woodland is recommended. Present site partially retrievable through strategic location and sensitive site, architectural, and planting design. Pipe lines in marshland are likely to leave a permanent man-made scar on the land.

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Terrain/Slopes	b. Rivers & Streams	c. Wetlands	d. Riparian Lands	e. Open Lands	f. Woodlands	g. Town Centers (image)	h. View Sheds	i. Noise & Smell
1. Pipe Lines									
2. Treatment Plants									
3. Outfalls & Flow Augmentation									
4. Spray Irrigation Facilities									
5. Rapid Infiltration Facilities									
6. Incineration Facilities									

LEGEND

L = Large Change

M = Moderate Change

S = Small Change

Description:

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : ONE
General Location : Brown Point
(17) Salisbury, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					M
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Potential opportunity if provided moderate land acquisition, moderate to extensive site improvements, and sensitive site, grading, and planting design.

Type of Environmental Change: LAND MODIFICATION / RECREATION
Alternative Number : ONE
General Location : Merrimack River
(16) Newburyport, MA

DETRIMENTAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants					
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description:

BENEFICIAL CHANGES

PROPOSED ELEMENT \ ENVIRONMENTAL ELEMENT	a. Path Systems	b. Passive Park & Wildlife Area	c. Water Access (visual)	d. Boat Landing	e. Recreation Facilities
1. Pipe Lines					
2. Treatment Plants		M	L	M	L
3. Outfalls & Flow Augmentation					
4. Spray Irrigation Facilities					
5. Rapid Infiltration Facilities					
6. Incineration Facilities					

LEGEND
L = Large Change
M = Moderate Change
S = Small Change

Description: Potential opportunity along riverfront if provided moderate land acquisition, moderate to extensive site improvements, and sensitive site, grading, and planting design.

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